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The effect of parental loss on cognitive and affective interference in adolescent boys from a post-conflict region

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ABSTRACT

Little is known about the impact of early-life stressors such as parental loss on cognitive-affective processing during adolescence, especially in regions chronically affected by war and armed conflict. Here, we tested 72 male adolescents living in Northern Uganda (ages 14–19), 52 of whom still had both of their parents and 20 participants who had experienced parental loss. Participants completed a classic color-naming Stroop task as well as an affective interference task, the opposite emotions test (OET). Adolescents with parental loss showed a decrease in performance over time, especially on the Stroop task. Critically, this decrement in performance was positively associated with reported symptoms of trauma, but only in the parental loss group. The current data suggest a difficulty in maintaining cognitive control performance in youths with experience of parental loss. The findings are discussed in relation to traumatic stress and mental health in post-conflict regions.

Introduction

Youths exposed to early trauma, such as maltreatment, displacement, orphanhood or becoming child soldiers show a high prevalence of psychological and social problems including anxiety, depression, or anger symptoms (Atwine, Cantor-Graae, & Bajunirwe, 2005), suicidal thoughts (Makame, Ani, & Grantham-McGregor, 2002) and post-traumatic stress symptoms (Derluyn, Broekaert, Schuyten, & De Temmerman, 2004). One frequently occurring consequence of armed conflict affecting children and adolescents is parental separation and parental loss (Albertyn, Bickler, van As, Millar, & Rode, 2003), which might constitute a potential vulnerability factor for psychopathology. Indeed, losing a parent carries major risk for development of psychiatric problems (Kaplow, Saunders, Angold, & Costello, 2010), and may affect academic performance, development, and psycho-social well-being of the individual (Dowdney, 2000). One study (Howell et al., 2015) reports links between traumatic symptoms, and reminders to loss and trauma on the one hand and protective factors such as coping responses on the other hand in the aftermath of war in adolescents. However, experimental evidence on the impact of parental loss on cognitive-affective functioning is lacking whereas evidence of other stressors such as maltreatment and neglect is slowly mounting (for review see Pechtel & Pizzagalli, 2011). On a theoretical level, it has been suggested (Luecken & Lemery, 2004) that like maltreatment, parental loss may increase vulnerability to physiological stress through impaired self-regulatory abilities and thus lead to adverse health including psychopathology.

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One critical skill underlying self-regulatory abilities is cognitive control, which predicts important factors such as academic performance, social functioning, mental health (Diamond, 2013; Moffitt et al., 2011). In its most basic form in the laboratory, cognitive control is most commonly associated with voluntary inhibition of responses, shifting between different tasks and maintaining and manipulating different items in working memory (Miyake et al., 2000). At the brain level, cognitive control is largely (but not only) associated with functioning of the prefrontal cortex. Increasing acknowledgment recognizes the importance of the prefrontal cortex and cognitive control in mental health (Cole, Repovs, & Anticevic, 2014). For example, youth exposed to childhood maltreatment evidence deficits in cognitive control (Carrion, Garrett, Menon, Weems, & Reiss, 2008; Hostinar, Stellern, Schaefer, Carlson, & Gunnar, 2012; Mueller et al., 2010) thus highlighting cognitive control as a critical protective or vulnerability factor after stressful experiences. During adolescence, cognitive control and prefrontal function are still maturing making it a particularly sensitive period of vulnerability (Casey, Tottenham, Liston, & Durston, 2005). Because of this protracted development, preventive and resilience-enhancing programs could tackle cognitive control impairments in children affected by early trauma (Zelazo & Carlson, 2012). In fact, it has been suggested (Lengua, 2002; Shonkoff, 2011) that boosting cognitive control and self-regulation may help youths to better cope with stressful experiences and display better adjustment.

However, cognitive control is not the only cognitive function affected by early trauma. Much research documents an impact of early adversity on emotion processing and regulation (e.g., Tottenham et al., 2011). Critically, recent work emphasizes the interactions between affective and cognitive processes (Cromheeke & Mueller, 2014; Mueller, 2011; Pessoa, 2008) and thus suggests that cognitive control might play an important role in affective symptom regulation in a state of disease (Cole et al., 2014). For example, motivational reward (such as monetary incentive) normally increases cognitive control in adolescents, an effect that is absent in internationally adopted youth (Mueller et al., 2012). In addition, two studies in traumatized adults (Mueller-Pfeiffer et al., 2010; Vythilingam et al., 2007) show significant affective interference during a cognitive control task for the PTSD group but not the healthy comparison group. Such affective interference might then be indicative of perturbed prefrontal cortical function and impaired emotion regulation ability. Evidence regarding affective interference of cognitive control after parental loss is currently missing.

Thus, the present study sought to investigate the influence of parental loss on cognitive and affective interference control in adolescents living in a post-conflict region. One geographical region that has been particularly affected by continued war and conflict is Uganda, which has been shaken by civil war for two decades until 2006 (Annan, Blattman, & Horton, 2006). Although recent estimates (Kalibala & Elson, 2010) suggest that nearly 2.5 million of the total Ugandan child population is orphaned, the impact of parental loss on cognitive-affective processing in such post-conflict regions has not been investigated. Based on previous research in traumatized individuals showing impaired interference control (Lovallo et al., 2013; Moradi, Taghavi, Neshat Doost, Yule, & Dalgleish, 1999) and difficulty in maintenance of cognitive control over time (Van Wingen et al., 2012), we used two tasks, one probing cognitive interference and the other affective interference. We hypothesized that parental loss would be associated with worse interference control relative to individuals who had not lost a caregiver and, that these individuals would exhibit difficulties maintaining performance over time relative to their peers. In addition, to account for possible differences in symptoms associated with traumatic events, scales measuring mental health symptoms (anxiety, depression, post-traumatic stress), and daily stressors were used.

Methodology

Participants

Seventy-five male students (ages 14–19 years) of the Doctor Obote College, a full boarding secondary school located in Lira, Northern Uganda, participated. The school was selected based on the criteria of feasibility (e.g., willingness to co-operate) and educational level. The project outline and its purpose were discussed with the school principal, who provided consent for testing at his school. Each student participated voluntarily and signed an informed assent form before participating. The study was conducted according to the ethical standards of the Declaration of Helsinki (1964) and its later amendments and was approved by the Ethical Committee of the Faculty of Psychology and Pedagogical Sciences, Ghent University, Belgium as well as the Ethical Committee of the Uganda National Council for Science and Technology. Of the 75 students, 1 person was excluded due to showing active signs of Malaria (headache and being confused) and 2 further participants were excluded due to outliers (3SD ± mean RT) reducing the total sample to 72. Of these, 52 boys (mean age = 16.67, SD = .83 years) still had both of their biological parents while 20 boys (mean age = 16.55, SD = 1.19 years) ($F(1,70) = .25$, $p = .62$) had lost one or both of their parents (16 lost their father and 6 their mother, with two of these having lost both) (Table 1).

Materials

Measures

To account for post-traumatic stress symptoms, these were assessed with the 22-item *Impact of Events Scale-revised (IES-R)* (*Horowitz, Wilner, & Alvarez, 1979*; *Weiss & Marmar, 1997*). Although the scale was originally designed for adults, it has also been frequently used for adolescents and has shown robust sensitivity in many cultural contexts including Rwanda (Dyregrov, Gupta, Gjestad, & Mukanoheli, 2000), Congo, and Uganda (Derluyn et al., 2004; Mels, Derluyn, Broekaert, & Rosseel, 2010). Previous research translated the *IES-R* successfully into Lango, the local North-Ugandan language and test reliability and